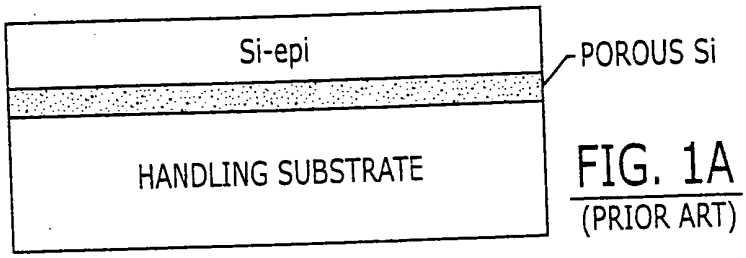

FIG. 1A
(PRIOR ART)

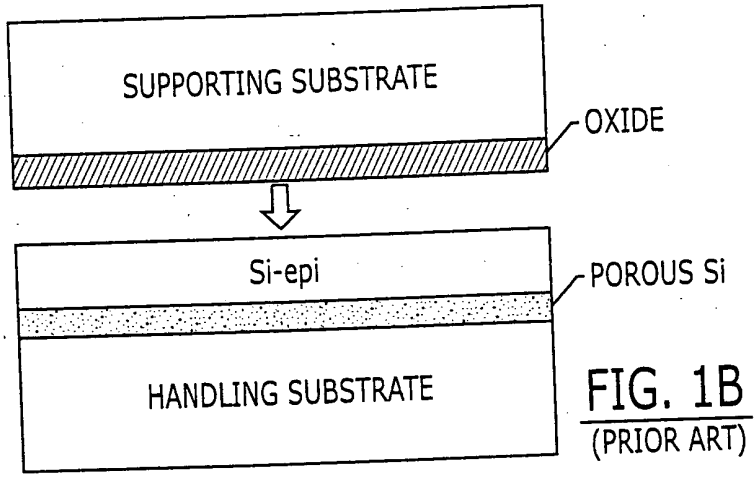

FIG. 1B
(PRIOR ART)

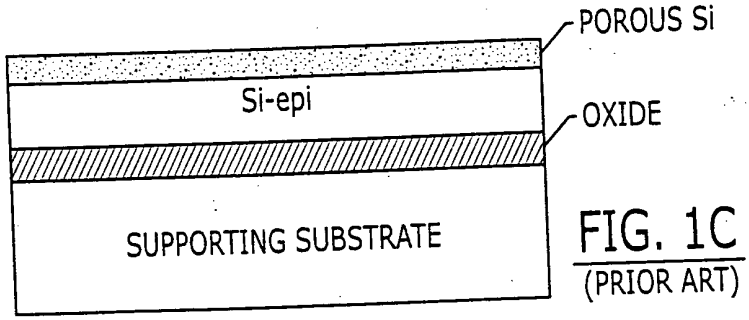

FIG. 1C
(PRIOR ART)

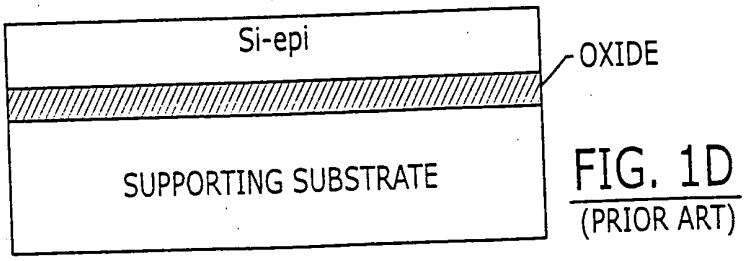

FIG. 1D
(PRIOR ART)

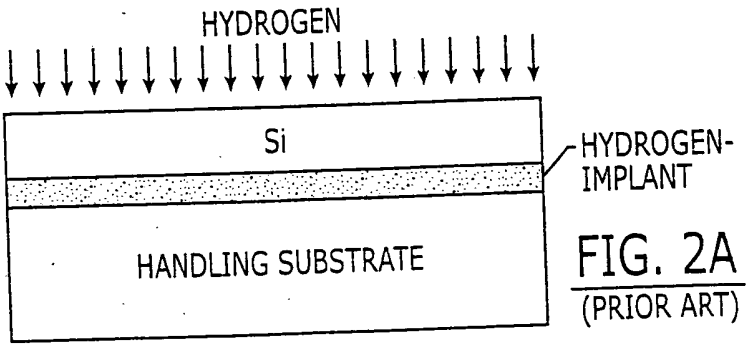

FIG. 2A
(PRIOR ART)

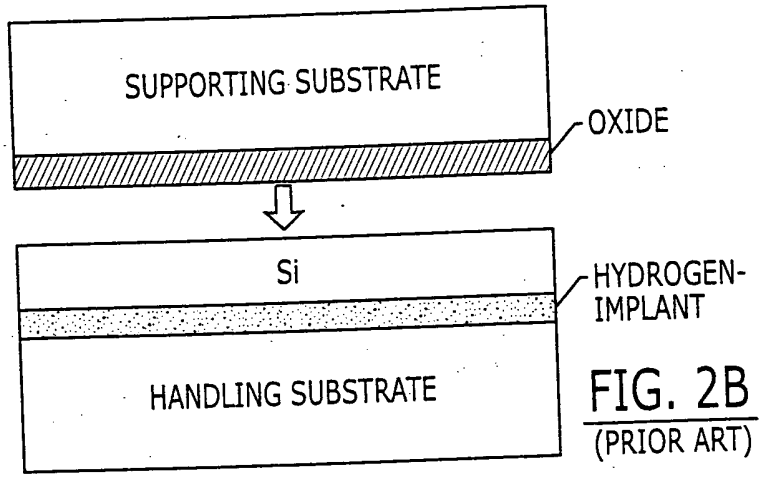

FIG. 2B
(PRIOR ART)

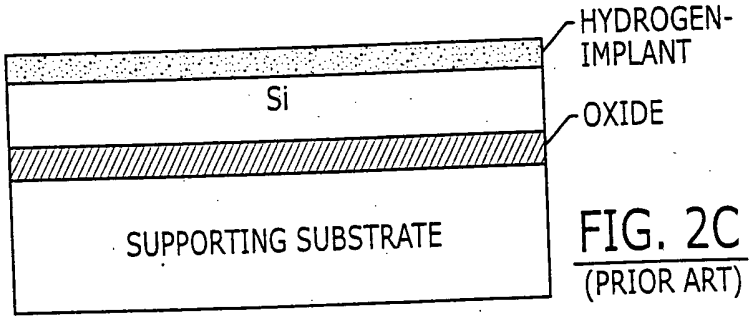

FIG. 2C
(PRIOR ART)

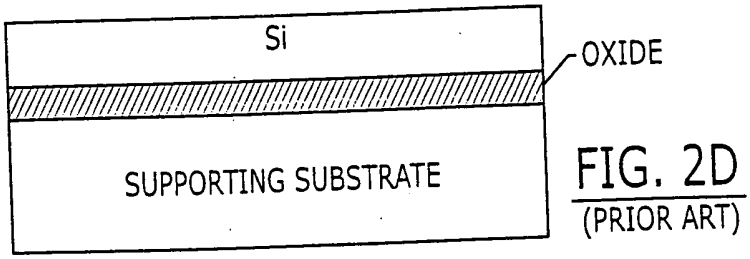

FIG. 2D
(PRIOR ART)

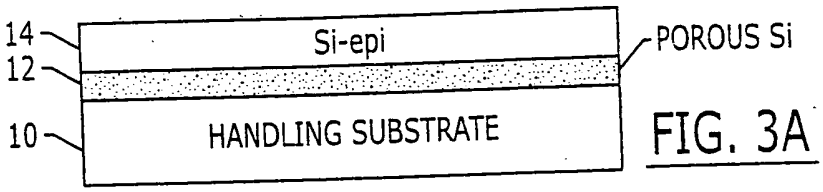

FIG. 3A

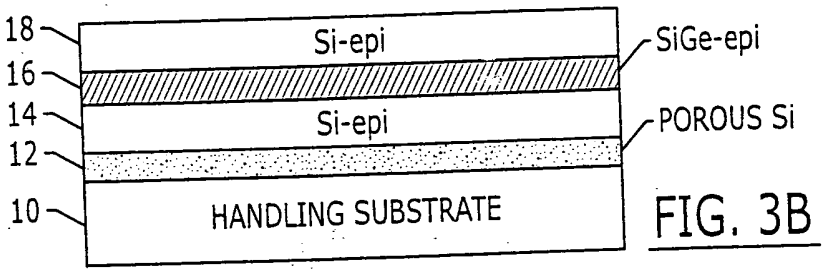

FIG. 3B

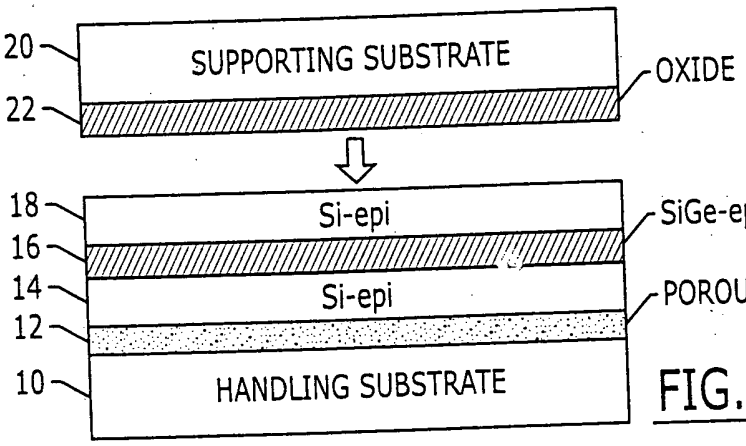

FIG. 3C

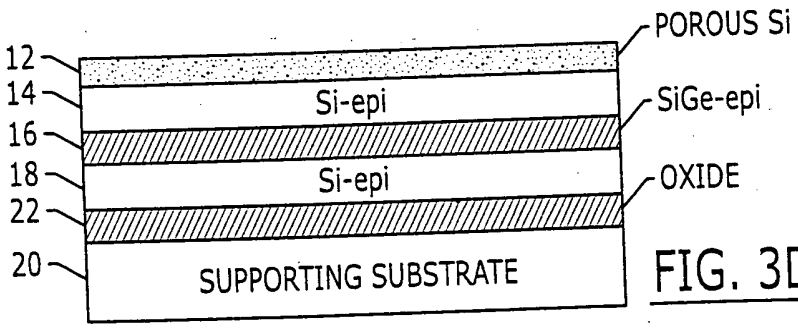

FIG. 3D

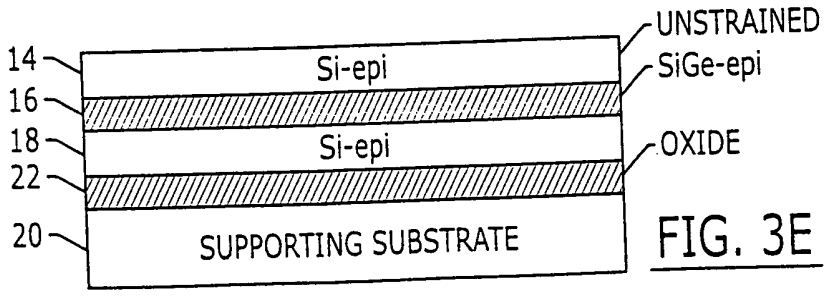

FIG. 3E

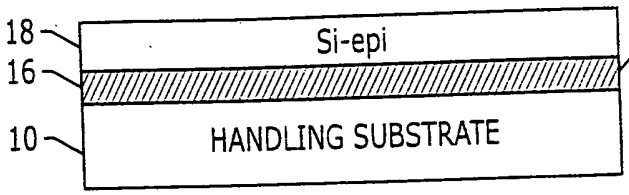

FIG. 4A

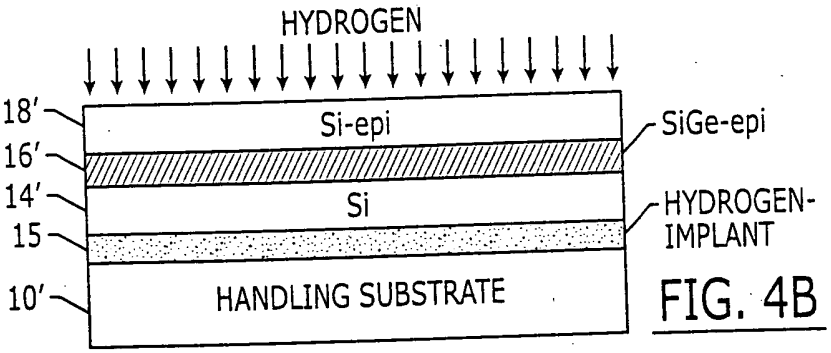

FIG. 4B

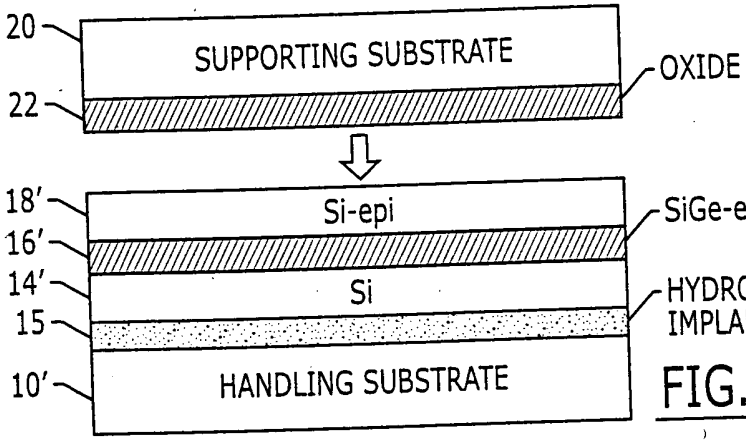

FIG. 4C

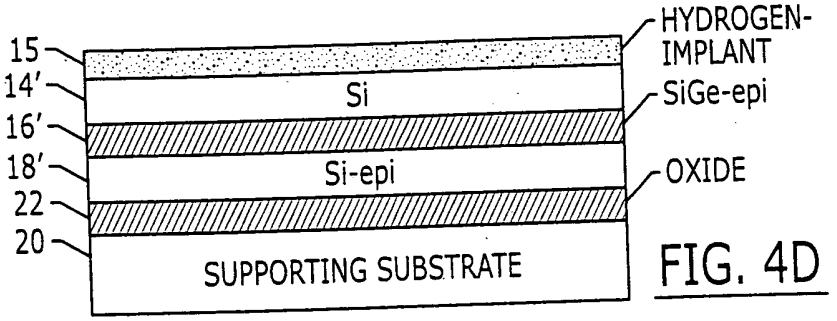

FIG. 4D

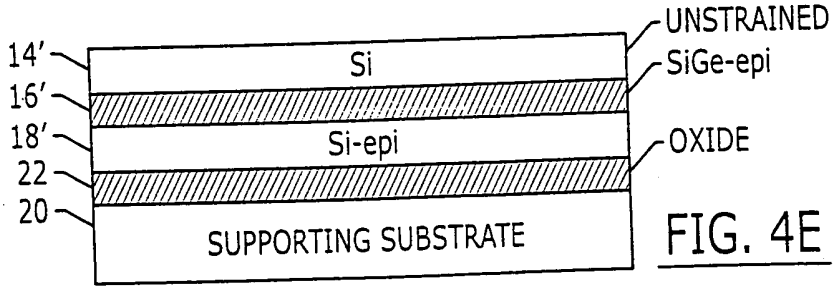

FIG. 4E

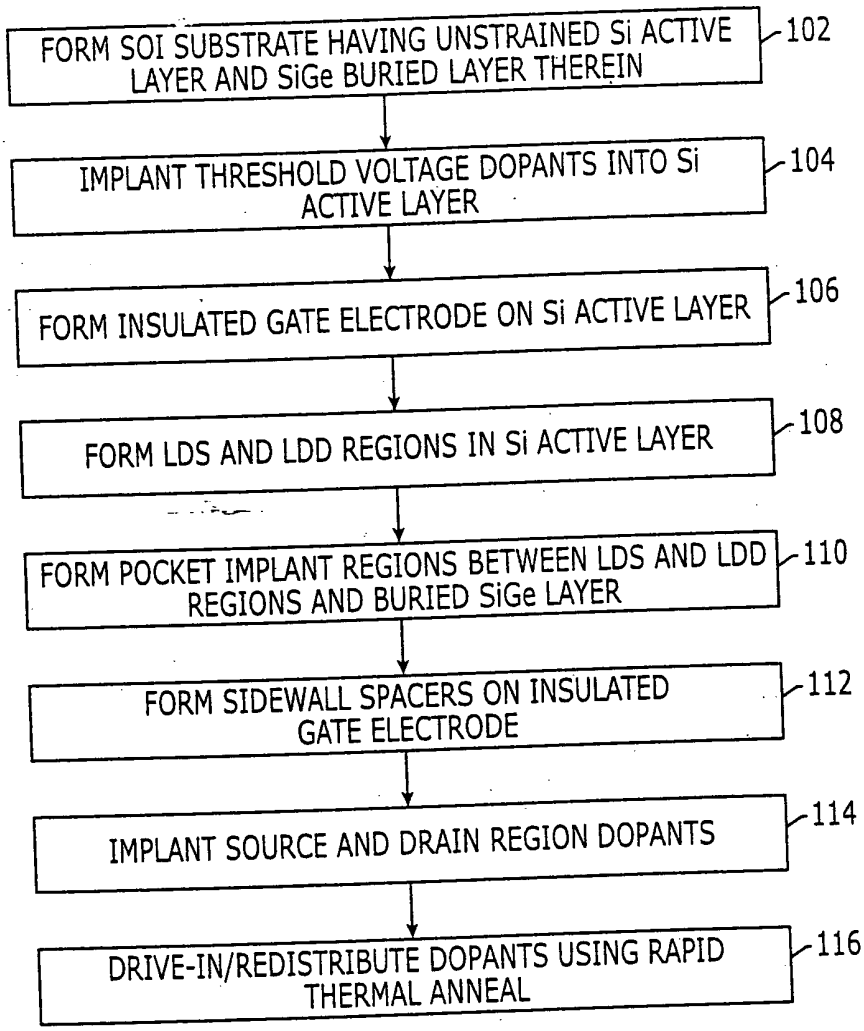
FORM SOI SUBSTRATE HAVING UNSTRAINED Si ACTIVE LAYER AND SiGe BURIED LAYER THEREIN
102
IMPLANT THRESHOLD VOLTAGE DOPANTS INTO Si ACTIVE LAYER
104
FORM INSULATED GATE ELECTRODE ON Si ACTIVE LAYER
106
FORM LDS AND LDD REGIONS IN Si ACTIVE LAYER
108
FORM POCKET IMPLANT REGIONS BETWEEN LDS AND LDD REGIONS AND BURIED SiGe LAYER
110
FORM SIDEWALL SPACERS ON INSULATED GATE ELECTRODE
112
IMPLANT SOURCE AND DRAIN REGION DOPANTS
114
DRIVE-IN/REDISTRIBUTE DOPANTS USING RAPID THERMAL ANNEAL
116

FIG. 5

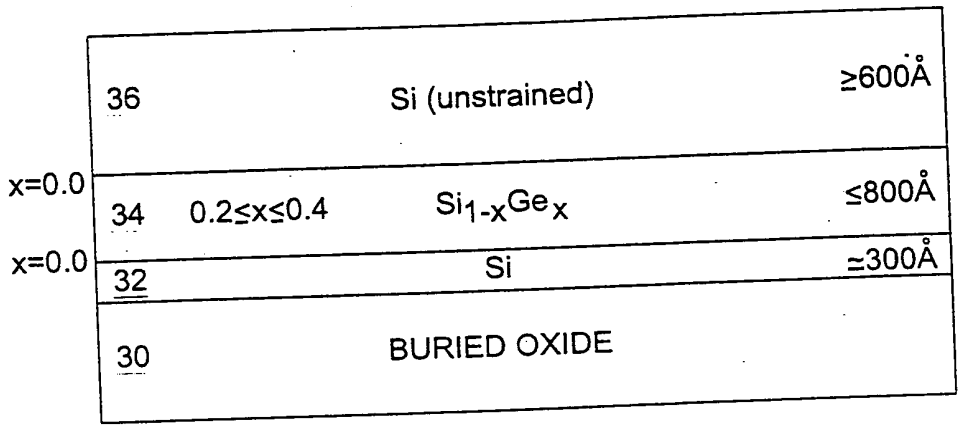

FIG. 6A

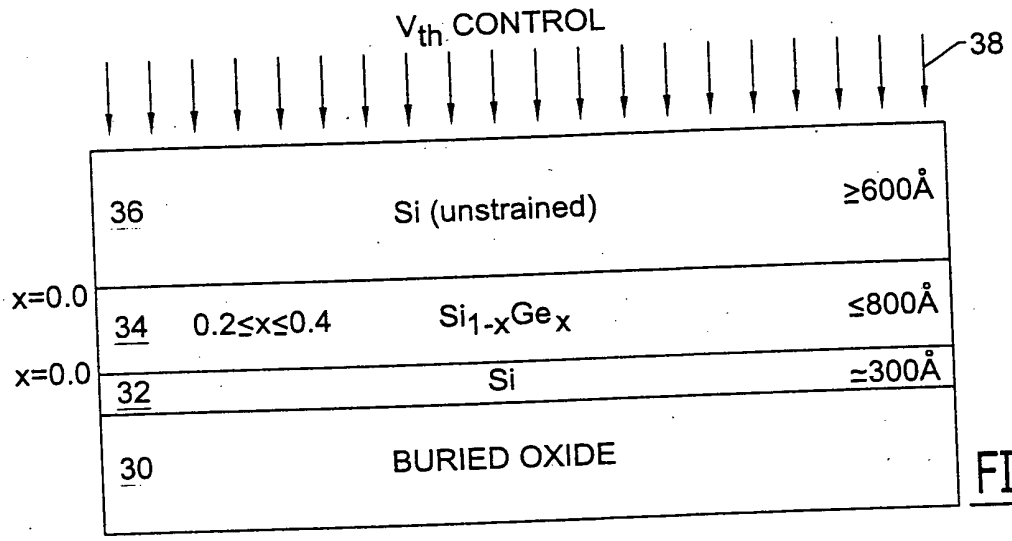

FIG. 6B

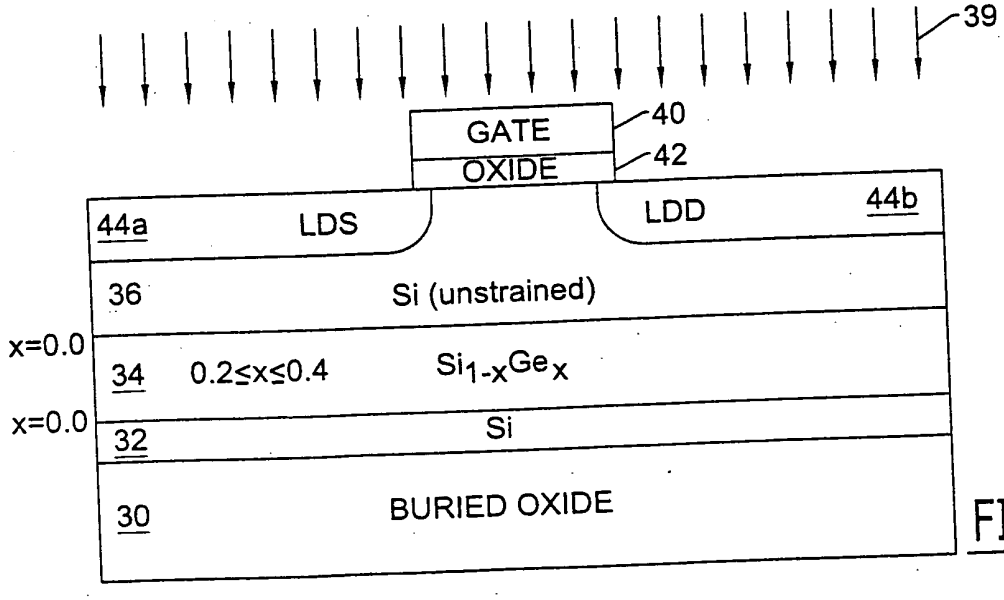

FIG. 6C

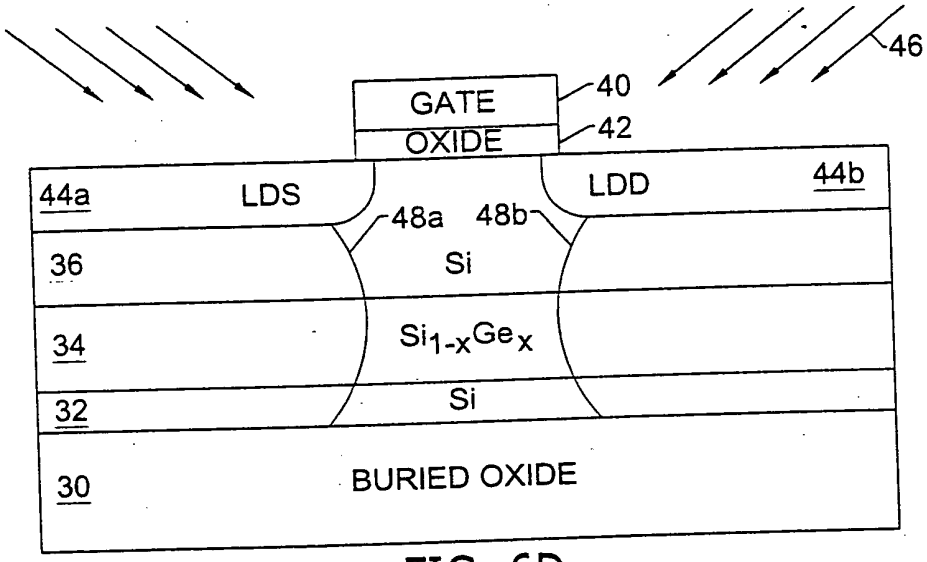
46
GATE
40
OXIDE
42
44a
LDS
LDD
44b
48a
48b
36
Si
34
Si1-xGex
32
Si
30
BURIED OXIDE

FIG. 6D

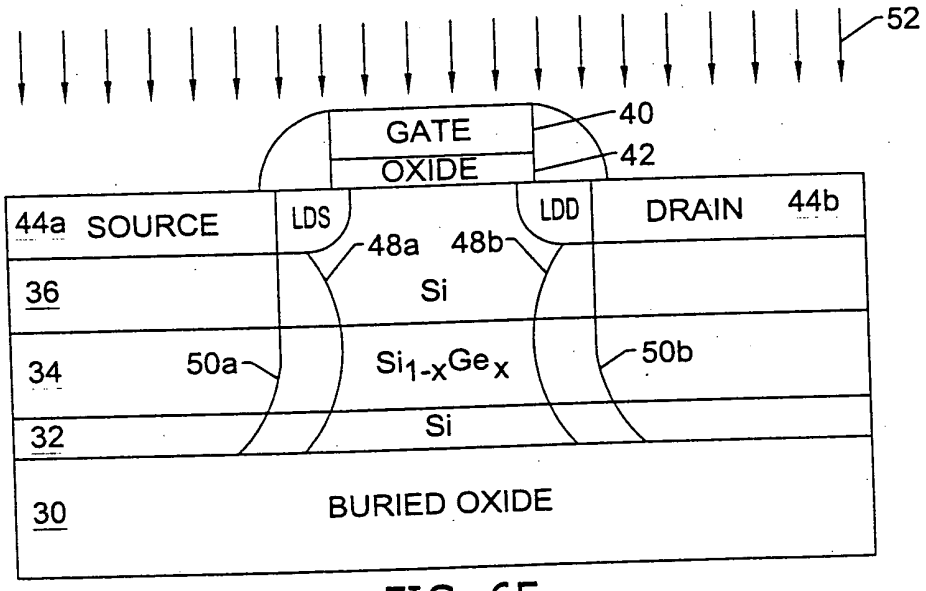
52
GATE
40
OXIDE
42
44a
SOURCE
LDS
LDD
DRAIN
44b
48a
48b
36
Si
34
50a
Si1-xGex
50b
32
Si
30
BURIED OXIDE

FIG. 6E

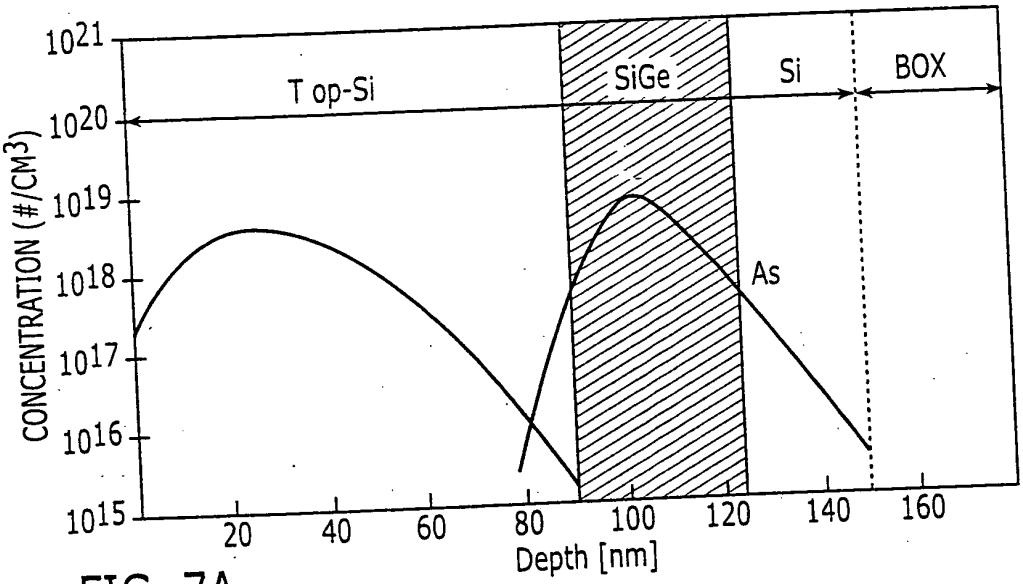
T op-Si
SiGe
Si
BOX
As
CONCENTRATION (#/CM3)
10^21
10^20
10^19
10^18
10^17
10^16
10^15
20
40
60
80
100
120
140
160
Depth [nm]

FIG. 7A

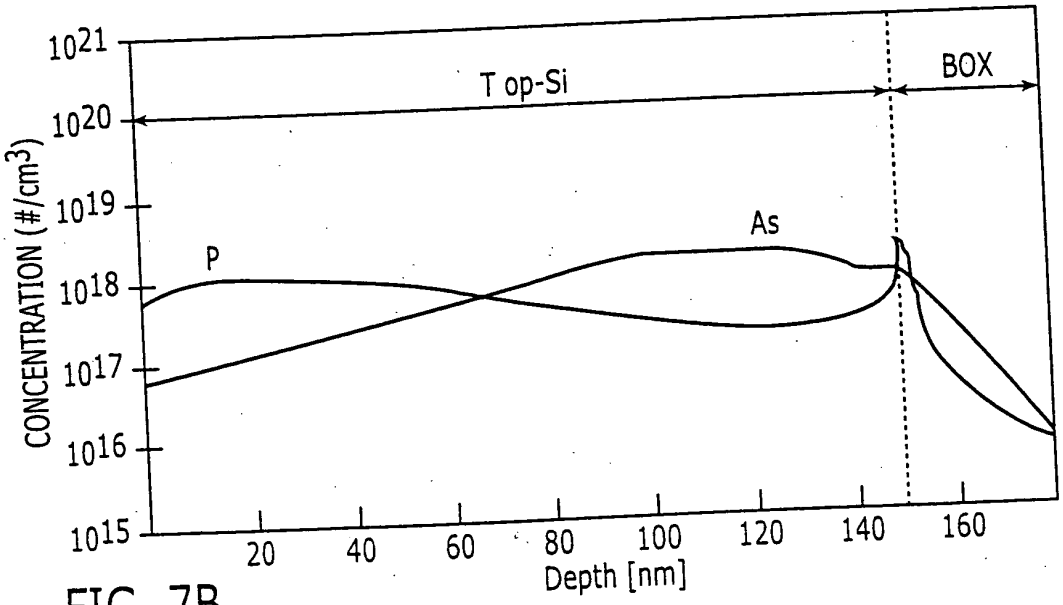
T op-Si
BOX
As
P
CONCENTRATION (#/cm3)
10^21
10^20
10^19
10^18
10^17
10^16
10^15
20
40
60
80
100
120
140
160
Depth [nm]

FIG. 7B

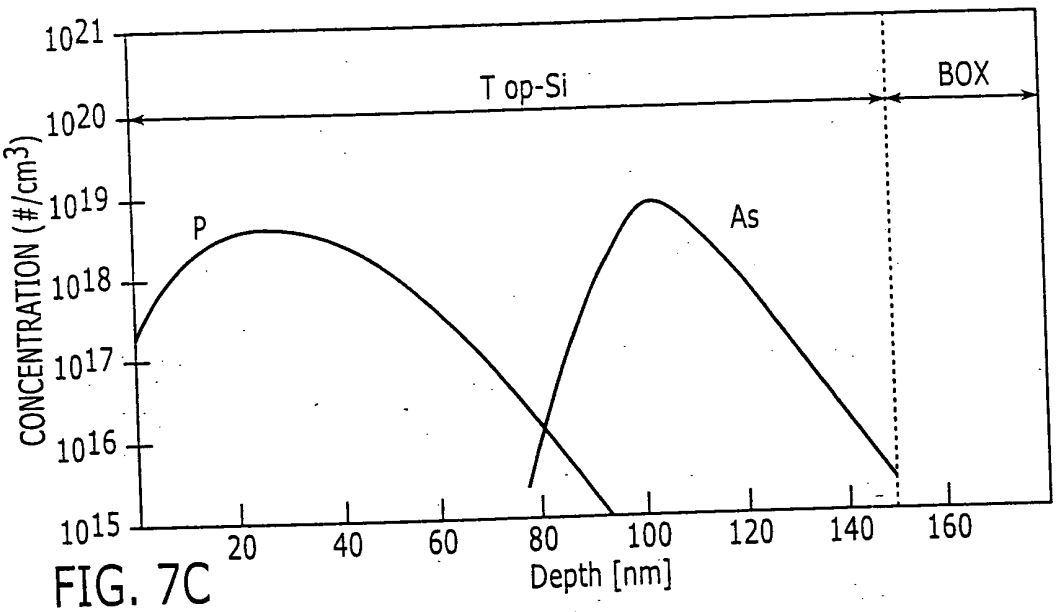
T op-Si
BOX
P
As
CONCENTRATION (#/cm3)
10^21
10^20
10^19
10^18
10^17
10^16
10^15
20
40
60
80
100
120
140
160
Depth [nm]

FIG. 7C

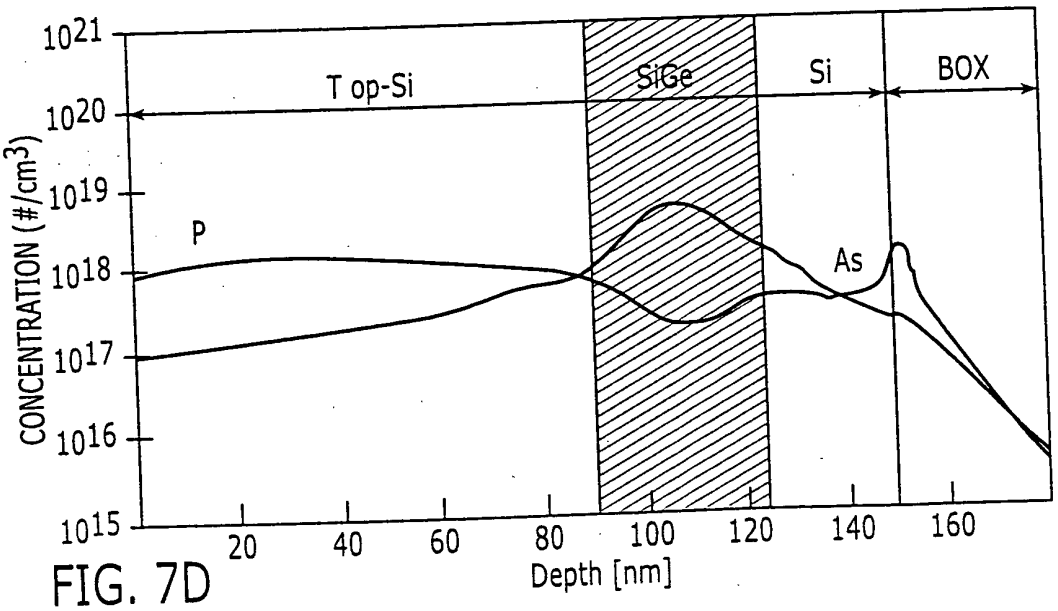
T op-Si
SiGe
Si
BOX
P
As
CONCENTRATION (#/cm3)
10^21
10^20
10^19
10^18
10^17
10^16
10^15
20
40
60
80
100
120
140
160
Depth [nm]

FIG. 7D